ROBOTIC DSP CONTROLLED MACHINES

MAX MEGATRON 2500

HIGH TRAFFIC COMMERCIAL HEAVY DUTY BRUSHLESS DC SWING GATE OPERATOR

2500 lb. capacity . . . Fast . . . High Performance

THE MAXIMUM LEVEL OF GATE CONTROL

C ETL LISTED US

325/991
UL Compliant

MAXIMUM MAX CONTROLS®

Patent Pending
MADE IN USA

MAX MEGATRON 2500

FEATURE LIST:

Mechanical Specifications

- Max Megatron 2500 dimensions (18" W x 19.7" D x 29.2" H)
- Heavy duty gear box 750:1 Size 80 constant lubrication using special gear oil
- Opens gates up to 2500lb/15ft or 2000lb/20ft
- Large output shaft 3¼" solid steel with cast iron clamping system
- Fast speed direct drive (no chains, belts, or pulleys) opens gate 90 degrees from 11½ to 20 seconds based on weight of the gate and selectable speed control
- Mechanical and electrical manual gate release functions
- Dual layer corrosion protection gold zinc and powder coating
- Built-in loop rack
- Gate operator shipping weight 220 lbs including operator, 1 control box, and 1 swing arm and battery module
- Continuous cycle at extreme temperature range. No overheating possibility
- Intelligent ramp-up and ramp-down gate speed control for smooth operation

Electrical Specifications

- Brushless DC motor equivalent to 1 HP AC motor
- Programmable gate speed controls, 16 selectable speeds
- Automatic gate position reset system
- Auto gate sync feature provides synchronous opening and closing between two gates
- Modular system design for ease of service
- Switchable 110/220 voltage selection
- Adaptive DSP control for advanced brushless DC motion control
- Real time performance analyzer and event log (OBD PORT and Black Box)
- Low voltage wiring capabilities for remote power up 500 feet (no battery needed)
- Solar ready battery module with built-in advanced solar regulator
- Intelligent power management system with energy saver mode
- Built-in current limited 12vdc and 24vdc outputs
- Gold contact input connections and automobile grade connectors
- Selectable open timer 0 to 60 seconds with timer off option
- -4F to 165F (-20C to +74C) operational temperature range including battery performance without needing a heater
- Robust lightning protection up to 20KVolts and 10KAmps on all inputs and outputs (44 Channels) including loop detector input connections
- Tunable 16 position safety obstruction sensor, adaptable to gate weight and size
- Dual motor overcurrent safety shut off for additional protection

- **Unique to MAX Megatron 2500**

- Every operator includes a Max BC-7 battery module with over 400 cycles in case of power failure
- ✓ Three modes of selectable battery backup functions
- ✓ State-machine design electronics with ultra-fast microprocessor
- On board three button station

Security Specifications

- ✓ High traffic intuitive loop management system for better security
- ✓ Advanced security features with built-in audible and remote alarms
- Magnetic lock control relay outputs with selectable delay times
- ✓ Tamper alert relay outputs triggered "on" if gate is forced open
- ✓ Audible alarm if gate is tampered with or ERD is triggered for higher security
- ✓ Gate partial open recorder
- ✓ Lockable cover with key lock release to prevent intruders and vandals
- ✓ Gate disable feature, disables all inputs with exception of the fire department input for high security
- ✓ Built-in transaction buffer for high security
- ✓ Gate status outputs for gate monitoring
- ✓ Direct motor control of jog OPEN/CLOSE for manually moving a gate in case of emergency
- ✓ Advanced anti-tailgate features to provide higher security
- No need for magnetic lock with the robust output shaft and clamp design of the Max Megatron 2500

Safety Specifications

- Adaptive obstruction sensor for much better gate safety system. 16 selectable sensitivity settings
- Built-in UL buzzer reset
- UL 325/991 compliant Class I, II, III, and IV. CSA approved
- Pinch arm protection design
- ✓ Magnetic dynamic brake system stops the gate immediately to prevent damage to obstructions
- ✓ Vehicle hit protection technology protects the gate operator from collision damage caused by automobile impact
- ✓ Built-in advanced entrapment protection and alarm output
- Built-in gate in motion alarm for industrial applications

✓ **Unique to MAX Megatron 2500**

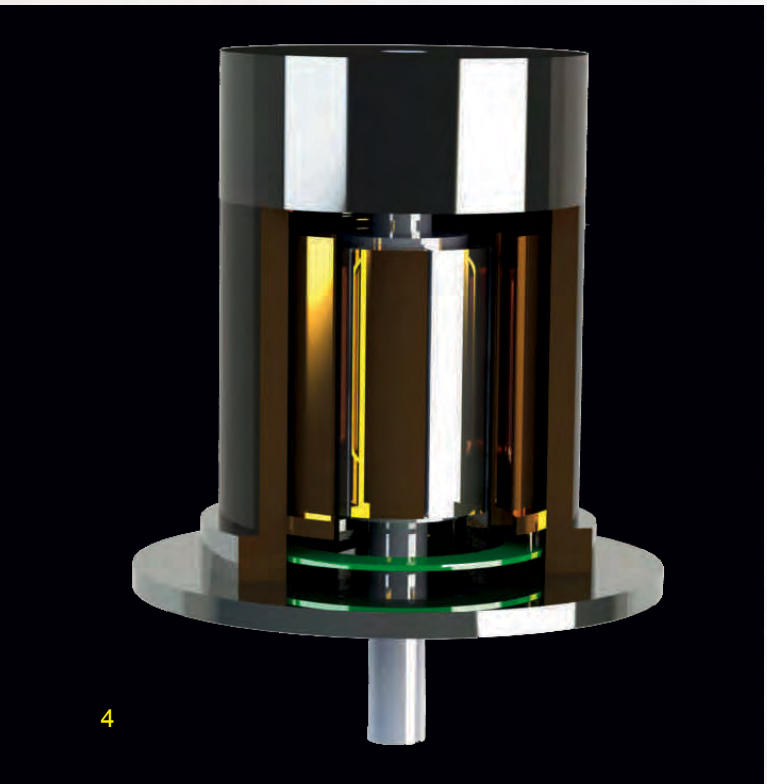
MOTOR CONTROLLER

Each Max Megatron 2500 operator has a motor controller. Maximum Controls proprietary motor control technology learns the physical characteristics of a gate in order to control motion with maximum efficiency and speed. The adaptive motor control of the Megatron also facilitates precision synchronization of two gates that might not be of equal weight or length. In addition to communicating with two motor controllers, a single Matrix 1 logic board allows for variable speed control within learned speed parameters.

The motor controller, using DSP technology, monitors all currents and voltages enabling 16 programmable levels of electronic obstruction sensing.

BRUSHLESS DC MOTOR

The brushless DC motor in the Max Megatron 2500 uses “Hall Effect” magnetic sensing to identify over five thousand precise rotational positions during 90 degrees of gate movement. That’s over 50 samples per degree of gate travel. Using this positional feedback, intelligent ramp-up and ramp-down of the gate speed is employed to minimize undue stress on all mechanical components.



Utilizing the monitoring and updating of positional data, a solid sync of two gates can be realized. This constant updating is also used to detect any unauthorized movement.

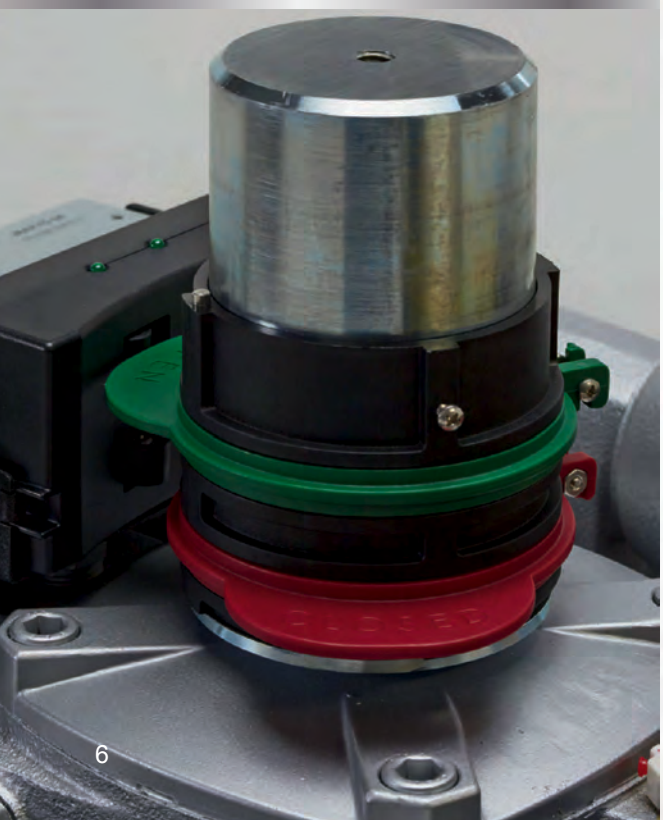
The 24VDC operating voltage of the brushless DC motor permits operation via a remote power supply. In this “low voltage mode,” the Max PS-24 power supply can be located up to 500 feet away making installation far less costly and easier than traditional 120VAC trenching.

ADVANTAGES OF BRUSHLESS DC MOTOR

FEATURE	BRUSHED DC MOTORS	BRUSHLESS DC MOTOR MAX
Commutation	Mechanical	Electrical
Maintenance	High	Very Low
Electronic Noise EMI	High	Super Low
Life	Short	Much Longer 6,000,000 Cycles
Speed/Torque Characteristics	Moderately Flat	Flat (Enables Operation at All Speeds)
Efficiency	Medium	High
Motor Speed	Limited Speed Control	Variable Speed Control
Audible Noise	High at High Speeds Because of Brushes	Super Quiet
Drive Complexity	Inexpensive	Advanced DSP Control
Loss of Torque Due to Aging	Yes	No
Energy Consumption	Higher	Lower
Magnetic Hall Sensors	No	Yes (5000 Samples Per 90 Degrees)
Warranty	Up to 5 Years	8 Years

DIRECT DRIVE

Direct gear drive means there are no pulleys, belts, or chains required. Pulleys, belts, and chains are historic weak points of gate operators and require frequent service and maintenance calls.



OUTPUT SHAFT

The Max Megatron 2500 has a 3.25 inch solid steel output shaft. This shaft along with heavy duty cast iron clamps provide the necessary clamping force to move the heaviest gates while providing a braking mechanism if the gate is struck by a vehicle. The massive shaft clamp assembly requires no shear pins or plates that are damaged by unintentional impact. If a gate controlled by the Megatron is struck, an intelligent reset system automatically recovers gate and limit positions. This means no costly maintenance or service fees. This serious clamp and output shaft design also makes the use of magnetic locks unnecessary.

MECHANICAL RELEASE

The Max Megatron 2500 provides a quick and easy means to release any gate without compromising security. The lockable swing arm cap protects from unauthorized release of the gate arm. Once the cap is removed, the arm is easily released by pulling up the quick release handle.

POWER SUPPLY

A key benefit of the Max Megatron 2500 modular design is the ability to separate modules. The power supply module, for example, can be removed from the main chassis and installed up to 500 feet away from the operator. Regardless of whether the battery is installed or the Max PS-24 is remote, the gate remains fully operational (the battery module is used only for backup operation). This feature can save thousands of dollars in trenching and costly permit fees. Unforeseen complications like rock formations or utility lines that have to be trenched around can be avoided by using a power management system that does not rely on battery power. As a result, the battery life is not compromised. The Max PS-24 is designed for extended life in extreme temperatures. These technologies are unique to only Maximum Controls products.

In addition, operation of the Max Megatron 2500 can save on energy costs. The average AC operator in a high traffic environment can cost as much as $700 a year. A similar facility using the Phantom can save as much as 85% on the gate energy cost.

UPS BATTERY BACKUP

The Max Megatron 2500 battery module, the Max BC-7, contains many features necessary for gate operation during power outages and provides safe, smart trickle charging to keep the batteries ready for emergencies or overnight in off grid use. In addition to serving as backup power during emergencies, the BC-7 contains the electronics to properly integrate a solar panel into an off grid configuration. Yes, the BC-7 supplies an on-board solar regulator as standard equipment.

Starting with the Max BC-7 front plate, a three LED gas gauge showing the current battery status—full, half, or empty is provided. This gauge also moves sequentially to indicate that the batteries are currently charging. A battery test status button, when pressed, gives you the actual condition of the batteries. Are the batteries a go or no go? No guess work here. You will know when the batteries must be replaced. When an outage does occur, an audible beep can be switched on to indicate battery backup in use.

On the Matrix 1 board there are three modes of battery backup functionality. “Leave gate open” will continue to open and close the gate until the battery is near empty and leave the gate in the open position. “Leave gate closed” will continue to open and close the gate until the battery is near empty, then leave the gate closed. “Open one time” will leave a gate in the open position immediately if an outage occurs. Regardless of the battery backup mode, enough energy is left in the batteries to open the gate for an emergency vehicle.

SOLAR READY POWER

In an off grid configuration, in addition to the solar regulator, the Max BC-7’s solar processing circuitry provides a power boost, maximizes energy harvest, and keeps a tight grip on the load control ensuring the up to 200 watt solar panel is manipulated to its potential. Maximum Controls operators work with 80 watt panels or greater depending on the specific application. Standard 200 watt panels are supported and recommended. The solar in on the BC-7 requires 24 to 35VDC.

Each Max BC-7 battery module is fitted with Yuasa batteries with an operational temperature range of -4 to 165F. These batteries offer high-energy density, sealed leak proof construction, excellent performance in float of cyclic applications, maintenance free, rechargeable, and long service life. When used with the Max Megatron 2500 they offer 250 cycles of duty before discharge.

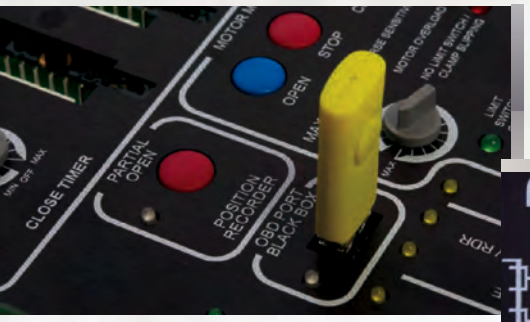
BLACK BOX, LOOP MANAGEMENT, AND SECURITY

One of the primary goals of the Max Megatron 2500 is to provide a secure easily maintained gate operator with higher gate speed motion and advanced loop management.

The Megatron uses non-volatile memory to continuously log performance characteristics and input/output events. A service technician can access this data via USB port to download the event history, quickly diagnosing complex or intermittent problems that have been very difficult to isolate and repair in the past. A thumb drive plugged into the USB, with all history downloaded, acts as a "Black Box" to find out what happened. The Megatron's event history is stored as a .TXT document which can be emailed to the factory for, if necessary, on site diagnosis. The .TXT file is a log of the most recent 1000 events reported by each module to the central logger.

The Megatron 2500's standard intuitive loop management system, when enabled, will discourage tailgating and increase security for residential and high traffic installations. When the Anti-Tailgate switch is activated, any car tailgating a legitimate access will be forced to stop by a rapidly closing gate, forcing the tailgater to back up and thereby triggering the gate to close and deny unauthorized access.

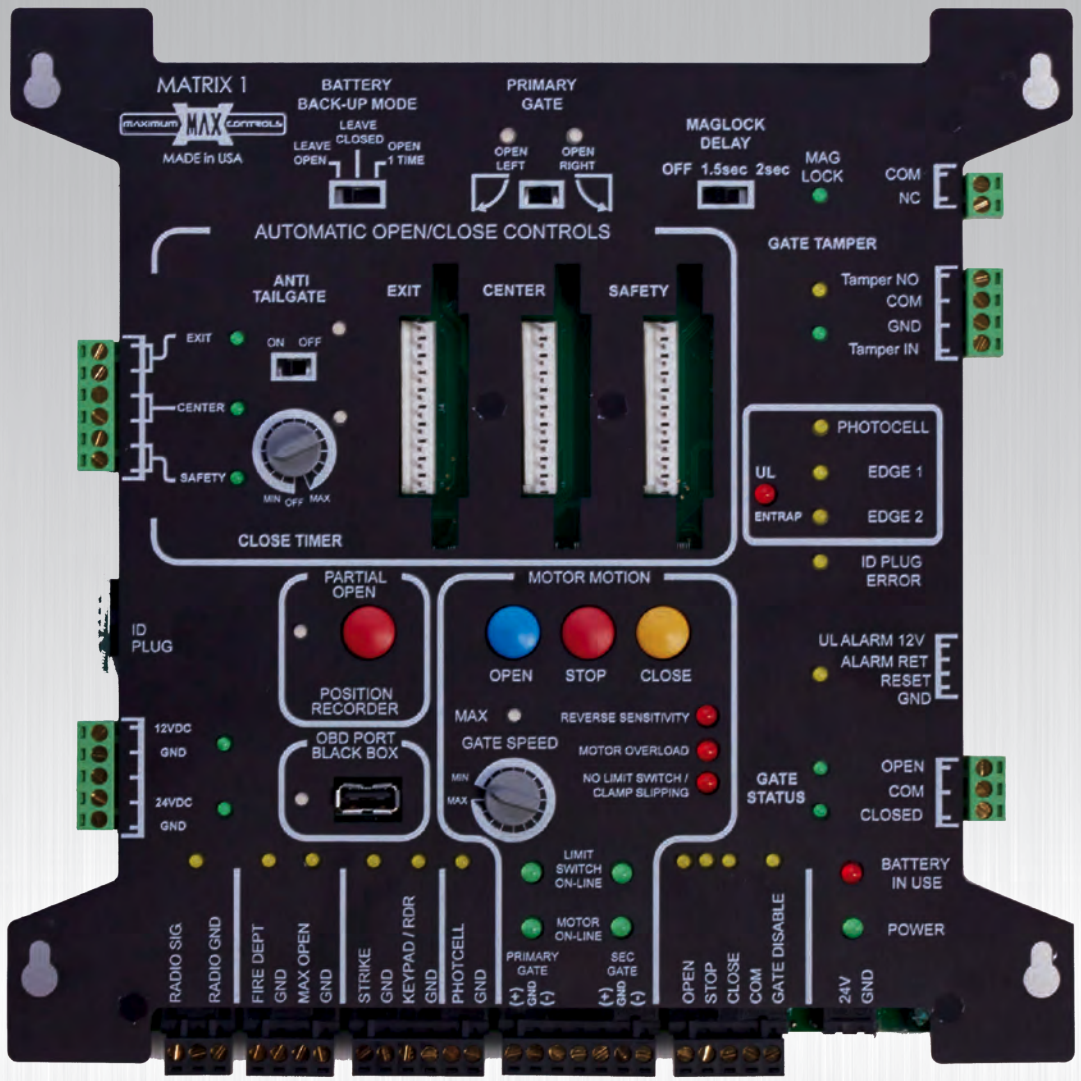
When disabled, loop management will allow multi access, with the gate opening on each successive trigger in the traditional loop management manner.



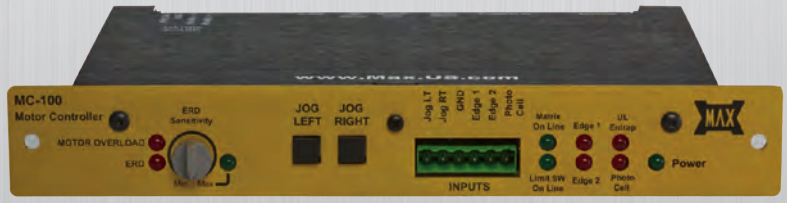
ADVANCED SECURITY FEATURES:

Anti-Vandalism/ Burglar Alarm

As a security device, the Max Megatron 2500 supplies a Gate Tamper relay output that triggers whenever a gate has encountered an unauthorized movement. This can be configured to activate an alarm system or camera. The Megatron 2500 also has a gate disable feature which can disable operator function during a vacation or overnight for commercial applications.



- Battery Backup Mode Switch Selection
- Primary and Secondary Gate Designation
- Magnetic Lock Delay Selectable Switch with Relay Outputs
- Loop Inputs with LED Indicators
- Anti-Tailgate Selector Switch
- On Board Three Button Station
- Motor Speed Control
- Motor Error Indicators
- UL Alarm Output and Reset
- Gate Status Outputs and Indicators
- 12vdc and 24vdc Limited DC Power Output
- OBD / Black Box USB Port



- Motor Overload Indicator
- Obstruction Electronic Reversing
- Detection (ERD) Indicator
- ERD Sensitivity Adjustment
- Jog Open/Close switches
- Safety and External Jog Switch Inputs
- Communication Indicators
- Safety Indicators
- Power Indicator

LIGHTNING PROTECTION

The Max Megatron 2500 offers the most robust lightning protection available in the industry. The Megatron 2500 protects all peripheral inputs, loop inputs, power inputs, relay outputs, and all communication lines (over 44 channels of protection) in 1/1,000,000,000 of a second. With special emphasis on power supply protection, the Megatron 2500 is guaranteed to withstand any lightning hit more than 50 feet away. Truly protected like no other operator in the world.

MAX MEGATRON 2500 WARRANTY

Maximum Controls LLC ("Manufacturer") warrants the original purchaser of this product, for the purpose to which this product is originally installed, that the product is free from defect in materials and/or workmanship for a period of 8 years for the Brushless DC Motor and cover, 5 years for everything else with the exception of the batteries which are limited to a 1 year warranty. The performance of this product is dependent on compliance to the instructions, maintenance, operation, and testing clearly outlined in the user manual. Failure to comply completely with those instructions will void this warranty in its entirety. This warranty does not cover damage to the product caused by vandalism, water damage, direct hit lightning strike, or installation errors.This warranty does not include any labor charges that might be needed to troubleshoot, replace, or repair a problem.

If, during the limited warranty period, one of the components exhibits a defect in material and/or workmanship, please call 949-699-0220 before dismantling the product. Shipping instructions and an RMA (Return Material Authorization) Number will be issued by the factory service center when contacted. Do not send any product in for service without an RMA number. Shipping charges to and from the factory service center for warranty repairs are the responsibility of the customer. Repair or replacement of any warranty item is made at the sole discretion of the Manufacturer.

ALL IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY AND SUITABILITY FOR A PARTICULAR PURPOSE, ARE LIMITED TO 8 YEARS FOR THE BRUSHLESS DC MOTOR AND COVER, 5 YEARS FOR EVERYTHING ELSE WITH THE EXCEPTION OF THE BATTERIES WHICH ARE 1 YEAR. NO IMPLIED WARRANTIES WILL EXTEND BEYOND THE WARRANTIES LISTED ABOVE. Some states do not allow limitations on how long an implied warranty lasts so this limitation might not apply to you.

This Limited warranty does not cover any problems with or relating to, the gate, the gate hardware, including but not limited to hinges, rollers, brackets, entry devices etc. Any service call that determines the cause of a problem to be external to the product could result in a fee. Under no circumstances shall the manufacturer be liable for consequential, incidental or special damages arising in connection with the use, or inability to use, this product. Under no circumstances will the Manufacturer's liability for breach of warranty, breach of contract, negligence or strict liability exceed the cost of the product covered herein. No person is authorized to assume for the manufacturer any other liability in connection with the sale of this product.

Printed February 2014

www.Max.US.com

Maximum Controls, headquartered in Southern California, has over thirty-three years of experience in the design and manufacturing of gate operators, telephone entry systems, and other perimeter security products for the access control industry. The team of professionals at Maximum Controls has a long and successful history as sales leaders and industry innovators. For the past four years it has been the sole focus of Maximum Controls to design the fastest, most secure, most reliable, and safest gate operators in the world. “I will not compromise quality,” I overheard Alex Parsadayan CEO of Maximum Controls saying to a customer. This philosophy has produced machines capable of great things. Gold plated inputs and outputs, automobile grade electronics throughout, cold rolled steel frames, massive cast iron gearboxes, output shafts and mechanical release assemblies so solid and heavy they’re sure to last for years. Longevity at a competitive price—that’s the key. Please compare Maximum Controls’ features, warranty, and innovations when shopping for a product. Conceived as the next generation in Access Control technology, Maximum Controls has designed the most advanced gate operators ever built.

Maximum Controls LLC
949.699.0220 ext 40
27211 Burbank
Foothill Ranch CA 92610
USA

Independent Dealer or Distributor